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APR 25 2001  
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SEQUENCE LISTING (A)

<110> Forschungszentrum Juelich GmbH; Marina Vrlijc et al

<120> Process for the microbial production of amino acids by  
boosted activity of export carriers

<130> 1

<140> PCT/DE96/02485

<141> 1996-12-18

<160> 2

<170> PatentIn Ver. 2.0

<210> 1

<211> 2374

<212> DNA

<213> Corynebacterium glutamicum

<220>

<221> CDS lysE (Lysin-Exporter)

<222> (1016)..(1726)

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gtctgtgagt ctagctagag atctagattc caggcgccat cgttgccaat acatcggtgt 180  
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acggtcttga agcacatctt tgggaccgaa gcgtaagacg ggcacgcag cccaatctag 420  
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Met

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gtg atc atg gaa atc ttc att aca ggt ctg ctt ttg ggg gcc agt ctt 1066

Val Ile Met Glu Ile Phe Ile Thr Gly Leu Leu Leu Gly Ala Ser Leu

5

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tta ctg tcc atc gga ccg cag aat gta ctg gtg att aaa caa gga att 1114

Leu Leu Ser Ile Gly Pro Gln Asn Val Leu Val Ile Lys Gln Gly Ile

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aag cgc gaa gga ctc att gcg gtt ctt ctc gtg tgt tta att tct gac 1162

Lys Arg Glu Gly Leu Ile Ala Val Leu Leu Val Cys Leu Ile Ser Asp

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gtc ttt ttg ttc atc gcc ggc acc ttg ggc gtt gat ctt ttg tcc aat 1210

Val Phe Leu Phe Ile Ala Gly Thr Leu Gly Val Asp Leu Leu Ser Asn

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gcc gcg ccg atc gtg ctc gat att atg cgc tgg ggt ggc atc gct tac 1258

Ala Ala Pro Ile Val Leu Asp Ile Met Arg Trp Gly Gly Ile Ala Tyr

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Leu Leu Trp Phe Ala Val Met Ala Ala Lys Asp Ala Met Thr Asn Lys

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gtg gaa gcg cca cag atc att gaa gaa aca gaa cca acc gtg ccc gat 1354  
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gac acg cct ttg ggc ggt tcg gcg gtg gcc act gac acg cgc aac cgg 1402  
Asp Thr Pro Leu Gly Gly Ser Ala Val Ala Thr Asp Thr Arg Asn Arg

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gtg cgg gtg gag gtg agc gtc gat aag cag cgg gtt tgg gta aag ccc 1450  
Val Arg Val Glu Val Ser Val Asp Lys Gln Arg Val Trp Val Lys Pro

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atg ttg atg gca atc gtg ctg acc tgg ttg aac ccg aat gcg tat ttg 1498  
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gac gcg ttt gtg ttt atc ggc ggc gtc ggc gcg caa tac ggc gac acc 1546  
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gga cgg tgg att ttc gcc gct ggc gcg ttc gcg gca agc ctg atc tgg 1594  
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ttc ccg ctg gtg ggt ttc ggc gca gca gca ttg tca cgc ccg ctg tcc 1642  
Phe Pro Leu Val Gly Phe Gly Ala Ala Ala Leu Ser Arg Pro Leu Ser

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agc ccc aag gtg tgg cgc tgg atc aac gtc gtc gtg gca gtt gtg atg 1690

Ser Pro Lys Val Trp Arg Trp Ile Asn Val Val Val Ala Val Val Met

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Thr Ala Leu Ala Ile Lys Leu Met Leu Met Gly

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2374

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<213> Corynebacterium glutamicum

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20

25

30

Ile Lys Arg Glu Gly Leu Ile Ala Val Leu Leu Val Cys Leu Ile Ser

35

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45

Asp Val Phe Leu Phe Ile Ala Gly Thr Leu Gly Val Asp Leu Leu Ser

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55

60

Asn Ala Ala Pro Ile Val Leu Asp Ile Met Arg Trp Gly Gly Ile Ala

65

70

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80

Tyr Leu Leu Trp Phe Ala Val Met Ala Ala Lys Asp Ala Met Thr Asn

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Lys Val Glu Ala Pro Gln Ile Ile Glu Glu Thr Glu Pro Thr Val Pro

100

105

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Asp Asp Thr Pro Leu Gly Gly Ser Ala Val Ala Thr Asp Thr Arg Asn  
115 120 125

Arg Val Arg Val Glu Val Ser Val Asp Lys Gln Arg Val Trp Val Lys  
130 135 140

Pro Met Leu Met Ala Ile Val Leu Thr Trp Leu Asn Pro Asn Ala Tyr  
145 150 155 160

Leu Asp Ala Phe Val Phe Ile Gly Gly Val Gly Ala Gln Tyr Gly Asp  
165 170 175

Thr Gly Arg Trp Ile Phe Ala Ala Gly Ala Phe Ala Ala Ser Leu Ile  
180 185 190

Trp Phe Pro Leu Val Gly Phe Gly Ala Ala Ala Leu Ser Arg Pro Leu  
195 200 205

Ser Ser Pro Lys Val Trp Arg Trp Ile Asn Val Val Val Ala Val Val  
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Met Thr Ala Leu Ala Ile Lys Leu Met Leu Met Gly  
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SEQUENCE LISTING (B)

RECEIVED  
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<110> Forschungszentrum Juelich GmbH; Marina Vrlija et al.

<120> Process for the microbial production of amino acids by  
boosted activity of export carriers

<130> 1

<140> PCT/DE96/02485

<141> 1996-12-18

<160> 3

<170> PatentIn Ver. 2.0

<210> 1

<211> 2374

<212> DNA

<213> Corynebacterium glutamicum

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<221> CDS ORF3 (partial)

<222> (2)..(652)

<220>

<221> CDS LysG (Regulator lysE)

<222> (1421)..(2293)

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Ser Gly Lys Ala Leu Tyr Val Gly Ile Ser Ser Tyr Gly Pro Glu Leu

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aca gcg gag gcg gct gag ttc atg gcg gag gag gcc tgc ccg ctt ctg 145

Thr Ala Glu Ala Ala Glu Phe Met Ala Glu Glu Gly Cys Pro Leu Leu

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att cat cag cca agc tat tcc atc att aat cgt tgg gtg gag gaa ccg 193

Ile His Gln Pro Ser Tyr Ser Ile Ile Asn Arg Trp Val Glu Glu Pro

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ggc gat gac ggt gag aac ttg ttg cag tca gct gcc aac aat ggt ctt 241

Gly Asp Asp Gly Glu Asn Leu Leu Gln Ser Ala Ala Asn Asn Gly Leu

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ggc gtc att gct ttc tca cca ctt gcg cag ggc ctg ctc acg gac aaa 289

Gly Val Ile Ala Phe Ser Pro Leu Ala Gln Gly Leu Leu Thr Asp Lys

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tat ctc gat gga att cca gag ggt tcc cgc gcc agc cag ggt aag tcc 337

Tyr Leu Asp Gly Ile Pro Glu Gly Ser Arg Ala Ser Gln Gly Lys Ser

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ctg tct gag ggc atg ttg aac gtg aac aat att gat atg gtc cgc aag 385  
Leu Ser Glu Gly Met Leu Asn Val Asn Asn Ile Asp Met Val Arg Lys

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ctc aat gac atc gcc cag gaa cgc ggg cag tca ctt gcg cag atg gcg 433  
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ctt gca tgg gtg ctg cgc gag caa gga gag tac ggc gcg gat acc gtg 481  
Leu Ala Trp Val Leu Arg Glu Gln Gly Glu Tyr Gly Ala Asp Thr Val

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acc agt gca ttg att ggt gct tcg tca gtt gag cag ctg gac aac agc 529  
Thr Ser Ala Leu Ile Gly Ala Ser Ser Val Glu Gln Leu Asp Asn Ser

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170

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ctt gat tca ctc aac aac ttg gag ttt tct gac gcc gag ttg gag gcg 577  
Leu Asp Ser Leu Asn Asn Leu Glu Phe Ser Asp Ala Glu Leu Glu Ala

180

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atc gat gag att tcc cac gac gcc gcc atc aac att tgg gcg aag gcc 625  
Ile Asp Glu Ile Ser His Asp Ala Gly Ile Asn Ile Trp Ala Lys Ala

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acc gat tcc aaa acc cgc gaa aac taa cccatcaaca tcagtttgat 672  
Thr Asp Ser Lys Thr Arg Glu Asn

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Met Asn Pro Ile Gln Leu Asp Thr

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ttg ctc tca atc att gat gaa ggc agc ttc gaa ggc gcc tcc tta gcc 1492

Leu Leu Ser Ile Ile Asp Glu Gly Ser Phe Glu Gly Ala Ser Leu Ala

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ctt tcc att tcc ccc tcg gcg gtg agt cag cgc gtt aaa gct ctc gag 1540

Leu Ser Ile Ser Pro Ser Ala Val Ser Gln Arg Val Lys Ala Leu Glu

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cat cac gtg ggt cga gtg ttg gta tcg cgc acc caa ccg gcc aaa gca 1588

His His Val Gly Arg Val Leu Val Ser Arg Thr Gln Pro Ala Lys Ala

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acc gaa gcg ggt gaa gtc ctt gtg caa gca gcg cgg aaa atg gtg ttg 1636

Thr Glu Ala Gly Glu Val Leu Val Gln Ala Ala Arg Lys Met Val Leu

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ctg caa gca gaa act aaa gcg caa cta tct gga cgc ctt gct gaa atc 1684

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ccc gtg ttc aac gag gta gct tct tgg ggt gga gca acg ctc acg ctg 1780

Pro Val Phe Asn Glu Val Ala Ser Trp Gly Gly Ala Thr Leu Thr Leu

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Val Val Glu Leu Gly Thr Met Arg His Leu Ala Ile Ala Thr Pro Ser

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ccc gtc tta cgc ttc ggt ccc aaa gat gtg ctt caa gac cgt gac ctg 2020

Pro Val Leu Arg Phe Gly Pro Lys Asp Val Leu Gln Asp Arg Asp Leu

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Asp Gly Arg Val Asp Gly Pro Val Gly Arg Arg Arg Val Ser Ile Val

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gtg atc ctc ctc gat gag ata ccc att gac aca ccg atg tat tgg caa 2212

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cga tgg cgc ctg gaa tct aga tct cta gct aga ctc aca gac gcc gtc 2260

Arg Trp Arg Leu Glu Ser Arg Ser Leu Ala Arg Leu Thr Asp Ala Val

485

490

495

gtt gat gca gca atc gag gga ttg cgg cct tag ttacttctga aaaggttcag 2313

Val Asp Ala Ala Ile Glu Gly Leu Arg Pro

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<213> Corynebacterium glutamicum

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30

Thr Ala Glu Ala Ala Glu Phe Met Ala Glu Glu Gly Cys Pro Leu Leu

35

40

45

Ile His Gln Pro Ser Tyr Ser Ile Ile Asn Arg Trp Val Glu Glu Pro

50

55

60

Gly Asp Asp Gly Glu Asn Leu Leu Gln Ser Ala Ala Asn Asn Gly Leu

65

70

75

80

Gly Val Ile Ala Phe Ser Pro Leu Ala Gln Gly Leu Leu Thr Asp Lys

85

90

95

Tyr Leu Asp Gly Ile Pro Glu Gly Ser Arg Ala Ser Gln Gly Lys Ser

100

105

110

Leu Ser Glu Gly Met Leu Asn Val Asn Asn Ile Asp Met Val Arg Lys

115

120

125

Leu Asn Asp Ile Ala Gln Glu Arg Gly Gln Ser Leu Ala Gln Met Ala

130

135

140

Leu Ala Trp Val Leu Arg Glu Gln Gly Glu Tyr Gly Ala Asp Thr Val

145

150

155

160

Thr Ser Ala Leu Ile Gly Ala Ser Ser Val Glu Gln Leu Asp Asn Ser

165 170 175

Leu Asp Ser Leu Asn Asn Leu Glu Phe Ser Asp Ala Glu Leu Glu Ala  
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Ile Asp Glu Ile Ser His Asp Ala Gly Ile Asn Ile Trp Ala Lys Ala  
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Thr Asp Ser Lys Thr Arg Glu Asn  
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<212> PRT LysG (Regulator lysE)  
<213> Corynebacterium glutamicum

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Ser Gln Arg Val Lys Ala Leu Glu His His Val Gly Arg Val Leu Val  
35 40 45

Ser Arg Thr Gln Pro Ala Lys Ala Thr Glu Ala Gly Glu Val Leu Val  
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Gln Ala Ala Arg Lys Met Val Leu Leu Gln Ala Glu Thr Lys Ala Gln

65 70 75 80

Leu Ser Gly Arg Leu Ala Glu Ile Pro Leu Thr Ile Ala Ile Asn Ala

85 90 95

Asp Ser Leu Ser Thr Trp Phe Pro Pro Val Phe Asn Glu Val Ala Ser

100 105 110

Trp Gly Gly Ala Thr Leu Thr Leu Arg Leu Glu Asp Glu Ala His Thr

115 120 125

Leu Ser Leu Leu Arg Arg Gly Asp Val Leu Gly Ala Val Thr Arg Glu

130 135 140

Ala Asn Pro Val Ala Gly Cys Glu Val Val Glu Leu Gly Thr Met Arg

145 150 155 160

His Leu Ala Ile Ala Thr Pro Ser Leu Arg Asp Ala Tyr Met Val Asp

165 170 175

Gly Lys Leu Asp Trp Ala Ala Met Pro Val Leu Arg Phe Gly Pro Lys

180 185 190

Asp Val Leu Gln Asp Arg Asp Leu Asp Gly Arg Val Asp Gly Pro Val

195 200 205

Gly Arg Arg Arg Val Ser Ile Val Pro Ser Ala Glu Gly Phe Gly Glu

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215

220

Ala Ile Arg Arg Gly Leu Gly Trp Gly Leu Leu Pro Glu Thr Gln Ala

225

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235

240

Ala Pro Met Leu Lys Ala Gly Glu Val Ile Leu Leu Asp Glu Ile Pro

245

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Ile Asp Thr Pro Met Tyr Trp Gln Arg Trp Arg Leu Glu Ser Arg Ser

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Leu Ala Arg Leu Thr Asp Ala Val Val Asp Ala Ala Ile Glu Gly Leu

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Arg Pro

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